MAY 1 1 2007

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

Andrew Jackson Holliday
Regulatory Counsel
National Association of Home Builders
1201 15th Street, N.W.
Washington, D.C. 20005-2800

Dear Mr. Holliday,

I am writing you in response to your January 10, 2007 letter pursuant to Section 515 of P.L. 106-554 (the Information Quality Act) that the National Institute of Standards and Technology (NIST) received on January 11, 2007. Your letter requested correction of information disseminated by NIST, the U.S. Department of Energy (DOE) and its Element, the Energy Efficiency and Renewable Energy Office (EERE). As described below, NIST is in compliance with its Information Quality Standards, therefore, is denying your request for correction.

Utility
The intended audience for the material in NISTIR 7238 includes individuals and organizations within ASHRAE as discussed in your letter but also other important stakeholders in the building industry. These include building simulation and energy efficiency researchers, designers and manufacturers of building envelope systems and components, and various organizations charged with developing standards or regulations to improve building energy efficiency. Simulating the energy impacts associated with airflow in buildings is a difficult problem and the techniques developed by NIST and discussed in the report are of great interest to the researchers who are investigating building energy efficiency. These simulation techniques have been a subject of research for several decades, but have taken on renewed importance as energy use and environmental impacts have become a higher national priority. The second group, designers and manufacturers, are interested in innovative technologies for improving building performance. The analysis techniques, data and results presented in NISTIR 7238 are of great interest to those who design buildings and are developing technical solutions to reduce building energy consumption in a cost-effective manner. Finally, building envelope air tightness has long been neglected by building energy efficiency standards and related regulations, despite the potential for significant energy savings through reducing building air leakage. In addition to the ASHRAE committee noted in NAHB's request for correction, other organizations such as the General Services Administration, Department of the Army, and the DOE Federal Energy Management Program are also interested in developing envelope air tightness requirements.

Integrity
Prior to dissemination, NIST information, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NIST adheres to the standards set out in Appendix III, "Security of Automated Information Resources," OMB Circular

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A-130; the Computer Security Act, and the Government Information Systems Reform Act.

Objectivity

The information in the noted report (NISTIR 7238) is accurate and reliable in presentation and substance based on the technical soundness of the methodology employed and the reasonableness of the assumptions on which the analysis is based. In response to the concerns raised in your letter, we have re-examined the analysis methodology presented in the report and the inputs used to implement the analysis and remain convinced as to the technical correctness of both. Our confidence in the analysis methodology is based on its using well-established thermal analysis techniques that have been used for decades by a number of simulation tools enhanced by the inclusion of multizone airflow methods to calculate infiltration and airflow impacts on energy use. Most thermal analysis methods neglect to properly consider infiltration impacts, but the approach developed at NIST enables the inclusion of these important heat transfer mechanisms, making this analysis more complete than those previously considered in the field. In addition, the inputs to the analysis, the most critical of which are the building airtightness values, are based on consideration of all the measured data for U.S. commercial buildings. NIST has developed and maintained this database for several years and is confident that it is the best source of these input values in existence.

In considering NAHB's request for correction, NIST also re-examined the cost-benefit analysis employed in the report, which was presented only as an illustrative example to put the calculated energy savings in some context. While the cost values and scalar ratios used in this analysis could be endlessly debated, the critical point is that the assumed values are clearly presented as assumptions, and the transparency of the analysis method allows a reader to redo the calculations with any other values they see fit. Again, these calculations are simply example analyses to put the energy savings in some context and are not intended to make definitive statements of whether the airtightness approaches are cost effective or not.

In addition, the analysis on which this report is based followed established NIST policies for documenting the conduct of research and for predissemination review. The documentation of this research effort has been reviewed as part of this effort to re-examine the analysis performed. The predissemination review involved four separate and independent individuals reviewing the report prior to its release for technical content and clarity of presentation. One of these reviewers is specifically designated to provide input to NIST's Washington Editorial Review Board (WERB), which reviewed and approved NISTIR 7238 as it does every technical document produced by NIST prior to dissemination.

Your letter also raised a number of specific issues that question the objectivity of the information presented in the report. These issues are enumerated and responded to individually below, but in summary the calculations are reasonably determined to be factually correct in the view of the NIST based on the methodology employed and the

data on which the various inputs are based as described above. Also, the information is reproducible, in that the results could be substantially reproduced by others based on the description of the analysis method and the assumed input values described in the report. As noted above, the report went through NIST's internal review process before it was disseminated.

NAHB - The authors are recommending their work "... as a basis for important industry standards."

NIST Response: In addition to the intended audience described above, the report makes it very clear that the purpose of this analysis was only "... to provide input to the ASHRAE 90.1 Envelope Subcommittee...," not as a recommendation for any particular change. As a committee of an accredited ANSI standards developing organization, the ASHRAE SSPC 90.1 follows ANSI's requirements for due process and standards development. As such, the committee is free to consider whatever technical information they deem appropriate to pursue the title, purpose and scope of Standard 90.1.

NAHB - The letter describes the report as attempting to explain the effect of three different airtightening retrofit technologies: liquid-applied elastomeric coating of a masonry back-up wall, application of durable tape to frame wall sheathing joints, and upgrading from residential to commercial grade "house wrap" in a frame building.

NIST Response: NISTIR 7238 is more accurately described as an effort to estimate the energy impacts of reducing the air leakage of commercial building envelopes. NIHB's letter ignores the key concept of a continuous air barrier as a means to achieve such a reduction. This concept of an air barrier does not originate with this report, as air barriers have been described in this way in the technical literature for decades. The three specific technologies are only considered in separate analyses to put the energy savings in context through a cost-benefit analysis consistent with the methods employed by the ASHRAE 90.1 committee. The report points out that there are many different ways to achieve the target airtightness values, and these three are identified as examples only. Again, the report is not an attempt to examine these technologies themselves.

NAHB - Applying an elastomeric coating, or any of the other technologies considered, will not lead to the leakage reductions "claimed" in the report.

NIST Response: As mentioned above, neither the coating nor the other technologies alone are assumed to automatically lead to a specific leakage reduction. Rather, the concept of a continuous air barrier as described in the report and elsewhere in the technical literature is considered essential. As described in the referenced Lstiburek article, an airtight material is only one important aspect of an effective air barrier.

NAHB - ASHRAE Standard 90.1-2004 already addresses air leakage and therefore the noted airtightening technologies are only going to have a small incremental difference. The letter notes that section 5.4.3 of the standard "... lists seven

categories of joints or openings that must be caulked, gasketed, or sealed to achieve dramatic leakage reductions."

NIST Response: It is important to understand that the noted requirements in Standard 90.1-2004 are only qualitative and there is no reason to expect they will achieve any specific leakage reduction, let alone a dramatic one. In fact, these requirements have not changed since the standard was first published in 1975.

NAHB - The scalars used in the cost-benefit analysis are in error due to the overestimation of the leakage reduction, as shown by Martha VanGeem.

NIST Response: The use of the scalar factor and the selection of a specific value as a criterion for setting this or any standard requirements is entirely a 90.1 committee decision. The calculation of a scalar requires estimates of both energy savings and costs of implementing a change relative to current practice. The report provides an estimate of potential energy savings from implementing an air barrier relative to the specified baseline for a few specifically defined buildings given a number of described assumptions. Separately, the report includes estimates of required incremental costs for a few options that were developed by report co-author Wagdy Anis based on input from numerous sources including industry professionals. As described earlier, the 90.1 committee may consider these predicted potential savings, cost estimates and calculated scalars or develop their own estimates with input from NAHB and other interested parties. Please note that the 90.1 committee has held extensive deliberations on these issues and that Martha VanGeem participated as a committee voting member.

NAHB - "NIST is knowingly and intentionally feeding information to regulatory and administrative bodies in order to have a legal effect."

NIST Response: NIST has been conducting research into the airtightness of buildings envelopes for more than twenty years, including the development of measurement methods, providing guidance on how to achieve better airtightness performance and investigating the impact of envelope leakage on indoor air quality and energy consumption. The goal of this work has always been to advance the technical understanding of this important issue, as well as to provide voluntary standards development organizations with technical information to be considered in their work.

NAHB - NAHB objections to costs in report and amendments to 90.1

NIST Response: As noted earlier, NIST's goal was only to provide input to the 90.1 committee and not to institute any particular change to the standard. Whether and how the costs that might be associated with these changes might be revised are issues to be discussed within the 90.1 committee, and those discussions have been taking place for several years. Again, the 90.1 committee is free to consider technical information from any source they deem appropriate, including any technical analysis that NAHB wishes to prepare and submit to the committee. In fact, it is our understanding that an employee of the NAHB Research Center has already participated in committee discussions of the

proposed changes and submitted comments to the committee during its public review process.

Appeal

An appeal from an initial denial must be made within 30 calendar days of the date of the initial decision. Such appeal must be made in writing and addressed to:

Deputy Director
National Institute of Standards and Technology
100 Bureau Drive, Mail Stop 1000
Gaithersburg, MD 20899-1000

An appeal of an initial denial must include:

a. the requester's name, current home or business address, and telephone number or electronic mail address;
b. a copy of the original request and any correspondence regarding the initial denial; and
c. a statement of the reasons why the requester believes the initial denial was in error.

Please refer to www.nist.gov for additional information.

Sincerely,

Catherine S. Fletcher
Chief, Management and Organization Division

cc: Department of Energy Chief Information Officer